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(54) **AMBIDEXTROUS SAFETY LEVER**

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(51) **Int. Cl.**
F41A 17/74 (2006.01)

(52) **U.S. Cl.** **89/148**; 42/70.08; 42/70.01

(58) **Field of Classification Search** 42/70.01–70.11; 89/142, 148, 150, 154
See application file for complete search history.

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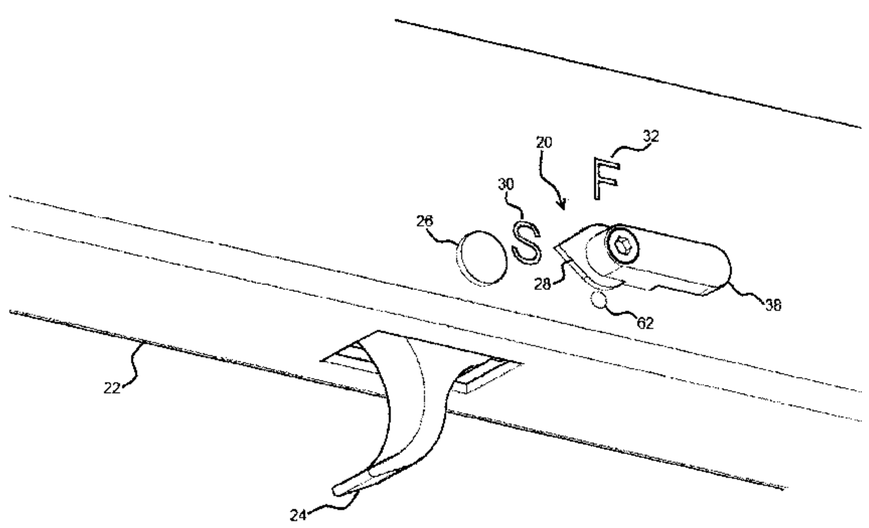
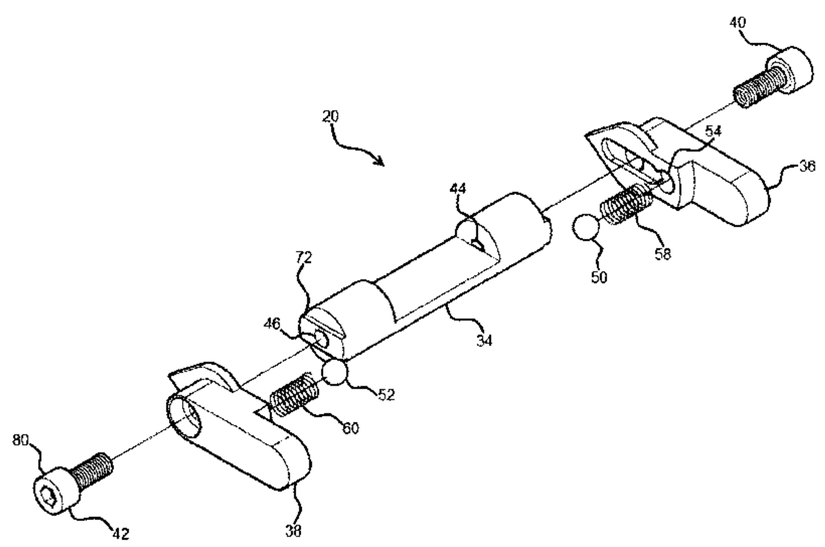
(57) **ABSTRACT**

This disclosure describes embodiments of an ambidextrous or reversible safety mechanism for firearms. The safety mechanism can be utilized on specific rifles and shotguns, for example an AK47, SAIGA or similar firearms, as a retrofit to reposition the existing safety mechanism to a configuration similar to or nearly identical to an AR15, M16 or similar firearms. In this way, personnel familiar with the safety operation of the AR15 or M16 will be able to operate the retrofit firearm without learning the operation of a new mechanism. Once retrofitted, the firearm safety mechanism will have the same visual appearance, action, and "feel" as the firearm with which they are familiar. The distance from the grip (trigger) to the engagement portion of the safety mechanism of the retrofit firearm will be very similar to that of the familiar firearm.

5 Claims, 5 Drawing Sheets





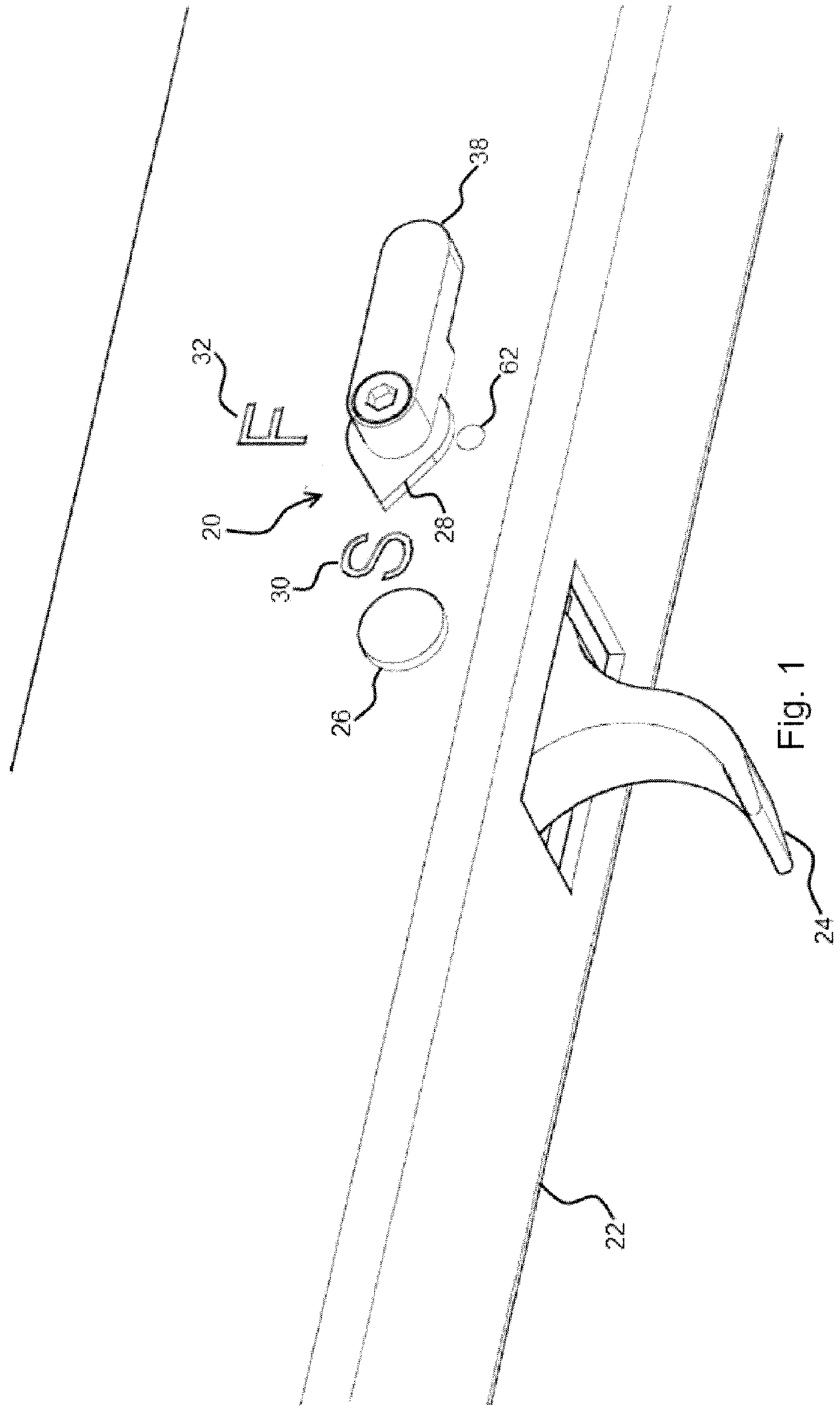


Fig. 1

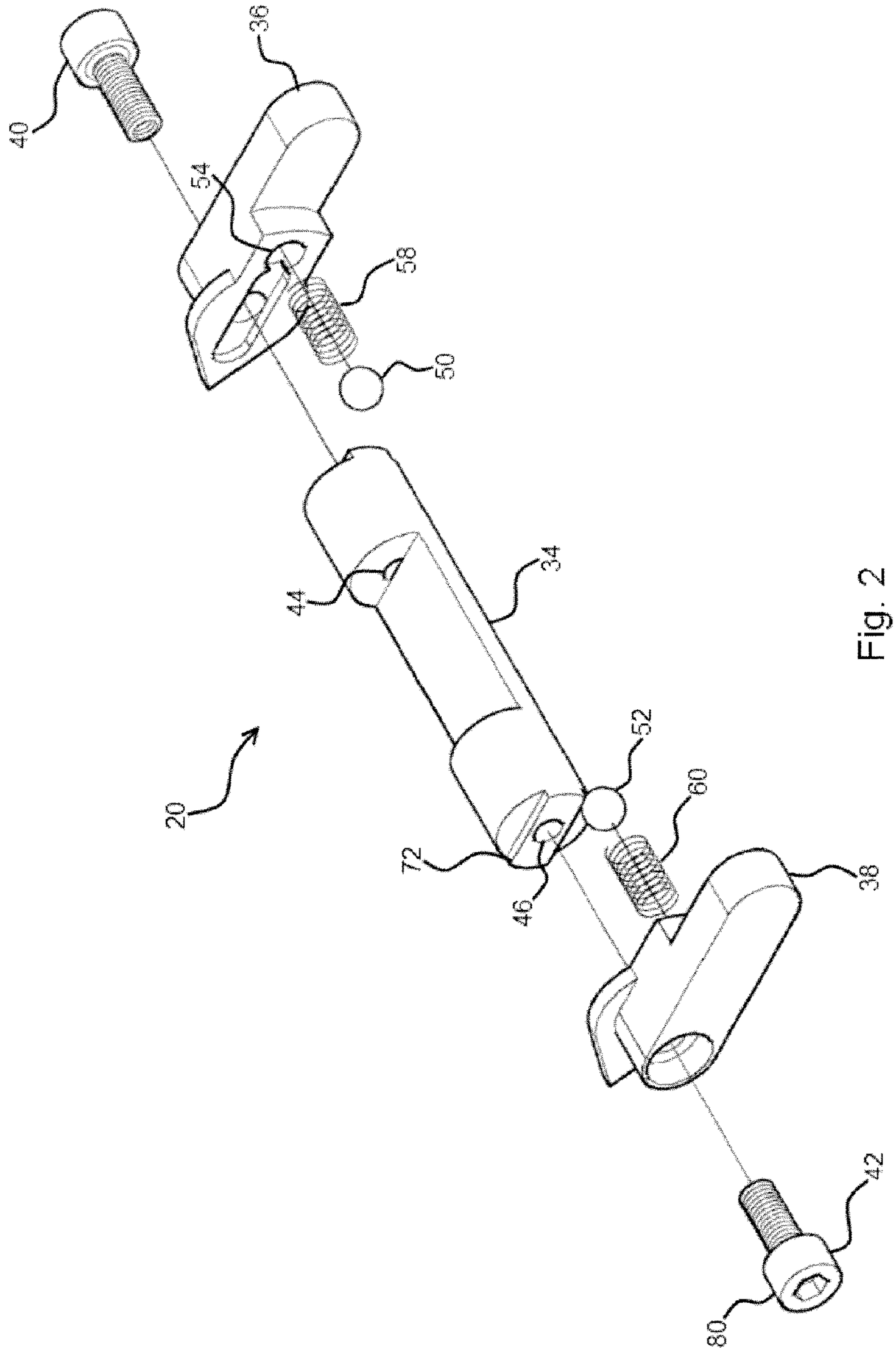


Fig. 2

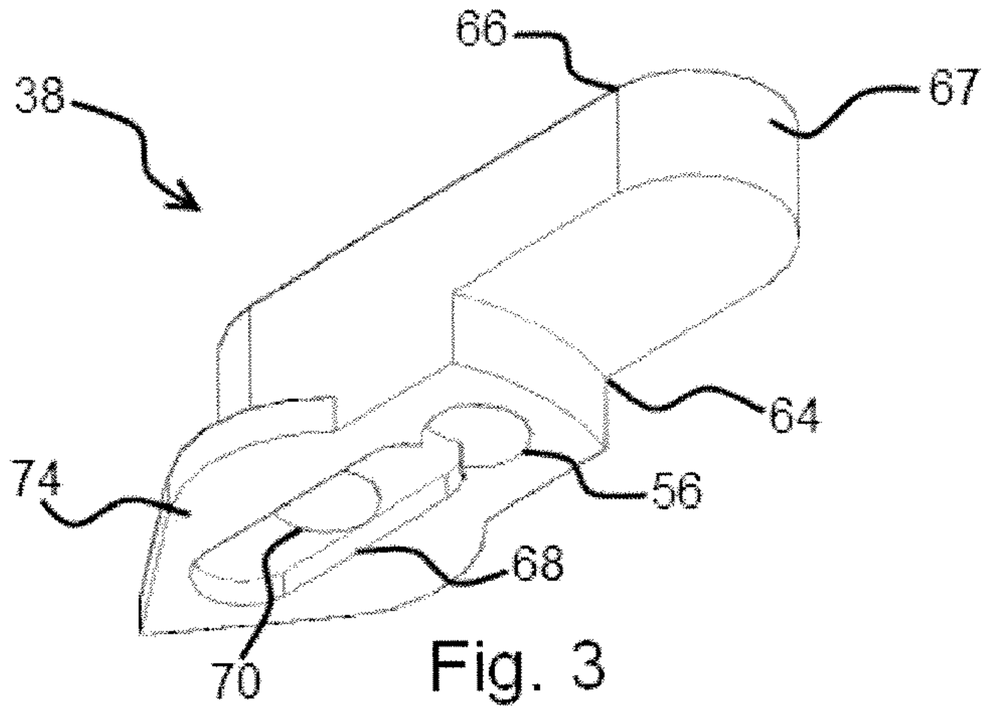


Fig. 3

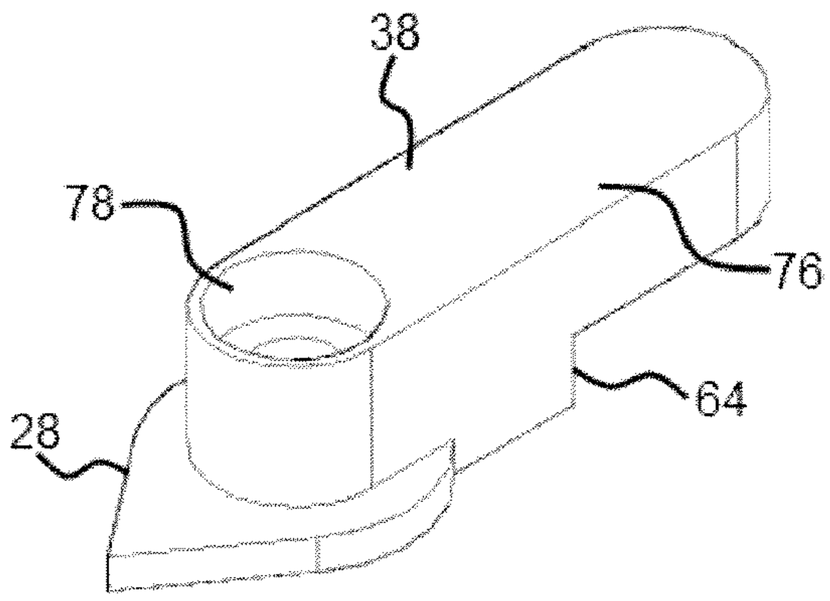


Fig. 4

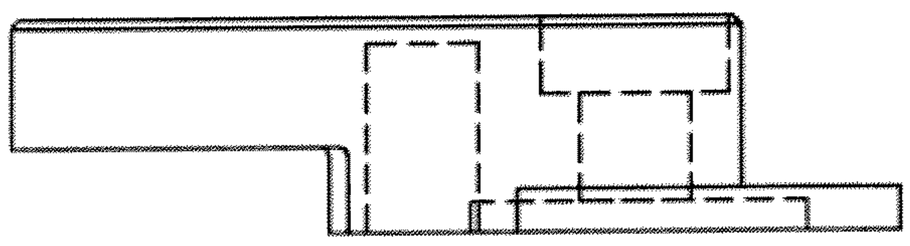


Fig. 5

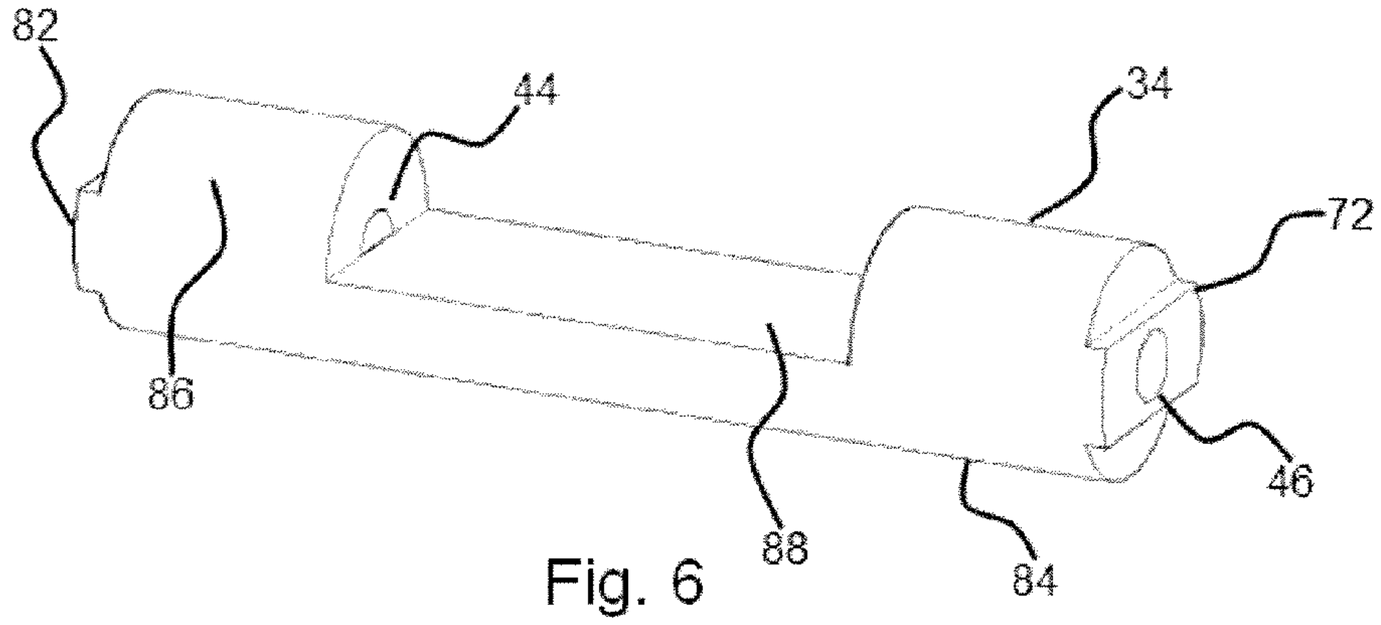


Fig. 6

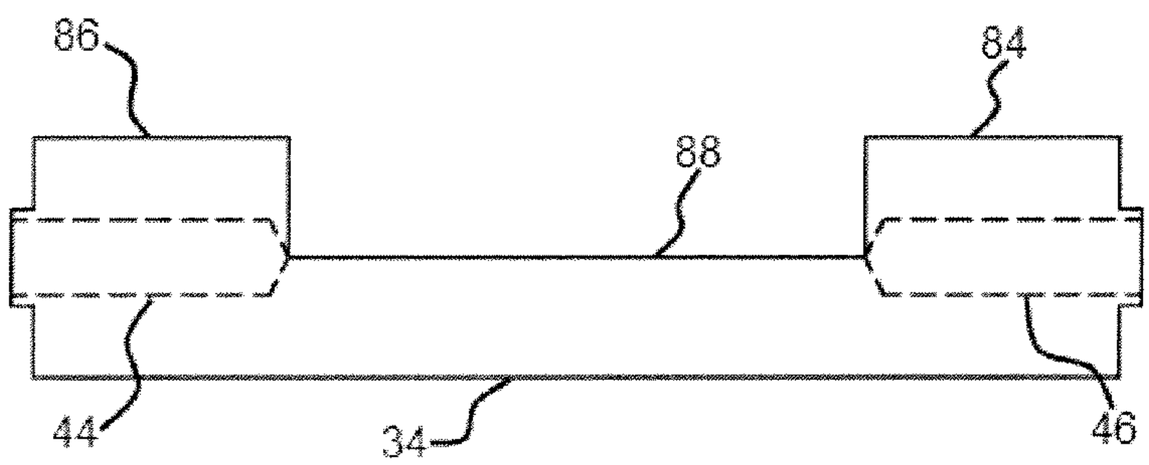


Fig. 7

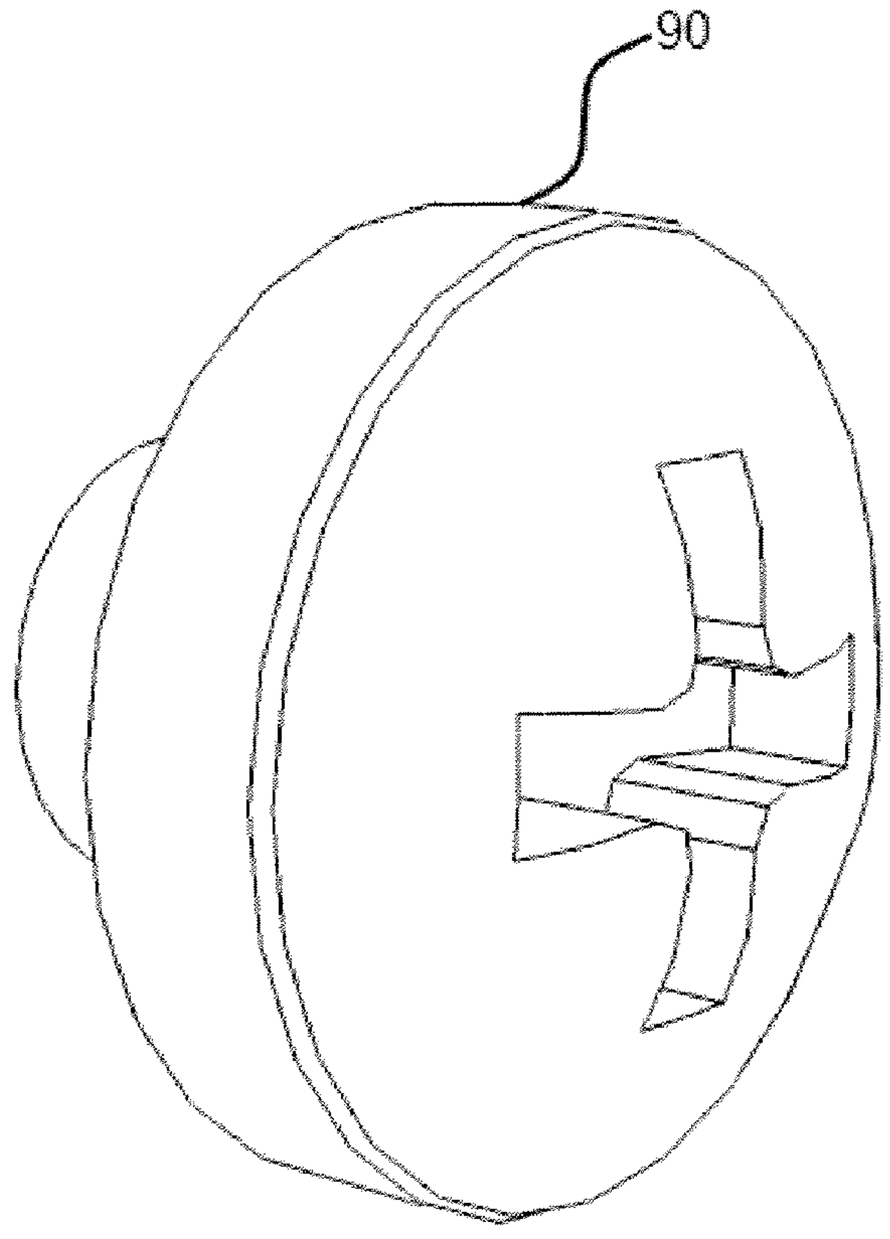


Fig. 8

AMBIDEXTROUS SAFETY LEVER

RELATED APPLICATIONS

This application claims priority benefit of U.S. Ser. No. 61/295,813, filed Jan. 18, 2010.

BACKGROUND OF THE DISCLOSURE

Field of the Disclosure

This disclosure relates to firearm safety devices. In particular, a safety which extends from both the left and the right lateral side of the firearm for ambidextrous adjustment thereof

SUMMARY OF THE DISCLOSURE

Disclosed herein is a retrofit safety lever for a firearm. The safety lever comprises a pin, a first engagement lever, and a first fastener.

The pin comprises substantially cylindrical longitudinal end portions, a clearance/cam portion between the substantially cylindrical end portions, a non-cylindrical face surface on at least one longitudinal end face and a receiving surface parallel to a longitudinal axis of the pin.

The first engagement lever comprises a surface defining a clearance hole, a mating surface operatively configured to engage the non-cylindrical face surface of the pin to facilitate rotational engagement between the first engagement lever and the pin, a user engagement portion operatively configured to provide leverage to a user rotating the first engagement lever, an indicator portion operatively configured to display to the user the relative rotation position of the pin, and a first fastener. The first fastener in turn comprises a first end with a minor diameter smaller than the clearance hole in the first engagement lever, the first end being configured to engage the receiving surface of the pin, and a second end with a major diameter larger than the clearance hole in the first engagement lever.

The safety lever as described above may further comprise a second engagement lever and a second fastener. The second engagement lever in turn comprises a surface defining a clearance hole, a mating surface operatively configured to engage the non-cylindrical face surface of the pin opposite the first engagement lever to facilitate rotational engagement between the second engagement lever and the pin, a user engagement portion operatively configured to provide leverage to a user rotating the second engagement lever, and an indicator portion operatively configured to display to the user the relative rotation position of the pin. The second fastener in turn comprises a first end with a minor diameter smaller than the clearance hole in the second engagement lever, the first end being configured to engage the receiving surface of the pin, and a second end with a major diameter larger than the clearance hole in the second engagement lever.

The safety lever as described above may be arranged wherein the first engagement lever and second engagement levers are substantially identical. This arrangement will allow the engagement levers to be manufactured much less expensively, and allow for repositioning on either side of the firearm.

The safety lever as described above may further comprise a surface defining a spring receiver in each of the first and second engagement levers, an indexing member operatively configured to at least partially be received in each spring receiver, and a compression spring operatively configured to fit within each spring receiver and bias the indexing member toward an indexing recess of the firearm.

The safety lever as described may be configured wherein the mating surface of the first indexing lever and the non-cylindrical face surface of the pin are bilaterally configured to allow connection of the first indexing lever to the non-cylindrical face surface of the pin in at least two unique orientations at 180° opposition. This arrangement will allow the indexing lever to be positioned on either side of the firearm.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an isometric view of the ambidextrous safety lever, in one form.

FIG. **2** is an isometric exploded view of the safety selector removed from the firearm, in one form.

FIG. **3** is an isometric view of the inner portion of the engagement lever, in one form.

FIG. **4** is an isometric view of the outer portion of the engagement lever, in one form.

FIG. **5** is a side hidden line view of the engagement lever, in one form.

FIG. **6** is an isometric view of the pin, in one form.

FIG. **7** is a side hidden line view of the pin, in one form.

FIG. **8** is an isometric view of a button cover, in one form.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

This disclosure relates to an ambidextrous or reversible safety mechanism for firearms. In one embodiment, the safety mechanism can be utilized on specific rifles and shotguns, for example an AK47, SAIGA or similar firearms, as a retrofit to reposition the existing safety mechanism to a configuration similar to or nearly identical to an AR15, M16 or similar firearms. In this way, personnel familiar with the safety operation of the AR15 or M16 will be able to operate the retrofit firearm without learning the operation of a new mechanism. Once retrofitted, the firearm safety mechanism will have the same visual appearance, action, and "feel" as the firearm with which they are familiar. The distance from the grip (trigger) to the engagement portion of the safety mechanism of the retrofit firearm will be very similar to that of the familiar firearm.

Looking to FIG. **1**, the ambidextrous safety lever **20** is shown attached to a firearm **22** in a way that will be described in more detail. Also shown is the firearm trigger **24**, which pivots around a pivot bar **26**, as is well known in the art. As shown in this embodiment, the ambidextrous safety lever **20** comprises an indicator portion **28**, which, as shown, points towards a graphic representation **30**. In one example, the graphic indicator **30** may indicate when the ambidextrous safety lever **20** is in a safe position, whereas a second graphic indicator **32** may indicate to the user when the ambidextrous safety lever **20** is repositioned to allow the firearm **22** to fire. Additional positions may be utilized, such as to indicate when the firearm is in automatic, manual, or semi-automatic mode.

Looking to FIG. **2**, the inter-operating parts of the ambidextrous safety lever **20**, in one form, are shown and will be described. One of ordinary skill in the art of designing and building firearm devices, especially rotating safety mechanisms, will be well-versed in a method for retrofitting firearms from their existing, single-sided safety device to the below disclosed ambidextrous safety lever. As shown, a central pin **34** in one embodiment is coupled to a plurality of engagement levers **36** and **38**, as previously shown in FIG. **1**. A plurality of fasteners **40** and **42** pass through a portion of each of the engagement levers **36** and **38** and are received by

a plurality of receiving surfaces, such as tapped holes **44** and **46** in the pin **34**. The hole **46** can be more easily seen in FIG. **6**. Additionally, a plurality of indexing members (balls) **50** and **52** are placed within a plurality of spring receivers **54** and **56**. The spring receiver **56** can be more easily seen in FIG. **3**. The balls **50** and **52** are forced outward, away from the levers **36** and **38**, by way of a plurality of compression springs **58** and **60**, which are also positioned within the spring receivers **54** and **56**. The compression springs **58** and **60** force the balls **52** outward, whereupon they may rest within a plurality of recesses, such as the recess **62** shown in FIG. **1**. These recesses **62**, in combination with the balls **50** and **52**, give the user a tactile response when the engagement levers **36** and **38** are in a proper orientation. Such combinations are well known in the art and are often called "bullet catches."

In one embodiment, the engagement levers **36** and **38** are of different lengths between the center of the clearance hole **70** and the outward end **67** of the user engagement portion **66**. In this way, the longer lever may be installed on the user's thumb side of the firearm and the shorter lever on the opposite side so as to improve thumb-side activation without the finger side interfering with firing of the firearm. As the inner portion **74** of each engagement levers **36** and **38** is substantially identical, the levers are reversible.

In another embodiment, one of the levers may be replaced with a substantially flush button **90**, as shown in FIG. **8**. In this embodiment, one side of the safety mechanism is removed so as to completely avoid any interference of the safety mechanism on one side of the firearm. While this embodiment does not allow for ambidextrous use while the button **90** is in place, the button **90** may be replaced at any point with one of the levers **36** or **38** by the user.

Moving onto FIG. **3**, the engagement lever **38** is shown, from what might be generally considered as the inner portion, the portion adjacent the side wall of the firearm **22**. As previously discussed, the spring receiver **56** can be more easily seen and generally comprises a cylinder-shaped opening that receives the spring **60** and ball **52**. It can also be seen how there exists, in one form, an offset **64**, such that the engagement portion **66** is not in direct contact with the outer surface of the firearm **22**, which would make it easier for the user to rotate the engagement lever **38** without being concerned about pinching his/her fingers against the side wall of the firearm **22**. Furthermore, a non-cylindrical surface **68** is shown adjacent the clearance hole **70**, through which the fastener **42** passes. This non-cylindrical surface **68** corresponds to a non-cylindrical surface **72** in one end of the pin **34**. This allows for the engagement lever **38** to exert additional rotational force against the pin **34**, as opposed to simply relying on frictional pressure between the inner portion **74** of the lever **38** and the pin **34**. As long as the non-cylindrical surface **68** corresponds to the shape and size of the non-cylindrical surface **72**, rotational force will be more easily transferred between the lever **38** and pin **34** without "slippage."

As shown in FIG. **4**, the engagement lever **38** also includes an outer portion **76**, which is generally opposite the inner portion **74**. Additionally, a countersink recess **78** may be included to receive the head portion **80** of the fastener **42**. In one form, the indicator portion **28** of the engagement lever **38** is formed in a shape that would clearly indicate to the user the direction or orientation of the engagement lever **38** relative to the firearm **22**, to most clearly show to the user the "mode" in which the firearm is set, whether this be a safe, firing, automatic, or other "mode."

Now looking to FIG. **6**, the pin **34** is shown and generally comprises the non-cylindrical protrusion **72** previously described on one end, and another non-cylindrical protrusion **82** on the opposite end. Additionally, the tapped holes **44** and **46** can also be seen. To allow for rotation of the pin **34**, the pin **34** comprises a plurality of cylindrical portions **84** and **86**, which may be disposed on alternate ends of the pin **34**. Additionally, the pin **34** comprises a cam portion or clearance portion **88**. It is this cam portion **88** that engages the trigger mechanism coupled to the trigger **24**, to allow the trigger **24** to be repositioned by the user for firing of the weapon, or alternately, to prohibit motion of the trigger **24**, firing pin, or other portions of the trigger mechanism. This prohibits the trigger **24** from repositioning and/or allowing the firing pin within the firearm **22** to engage any shell or cartridge. Such mechanisms are well known in the art, such as the four-position firearm fire control selector, found in U.S. Pat. No. 5,760,328 and incorporated herein by reference.

Looking to FIG. **7**, the cam portion **88** and cylindrical portions **84** and **86** can be seen from a different angle, which may enhance the user's understanding of how these parts interoperate. Furthermore, the tapped holes **44** and **46** can be seen as the dashed lines on either end of the pin **34**. Of particular note, these tapped holes **44** and **46** do not, in this embodiment, extend onto the cam portion **88**, which could interfere with operation of the pin **34**.

While the present invention is illustrated by description of several embodiments and while the illustrative embodiments are described in detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications within the scope of the appended claims will readily appear to those sufficed in the art. The invention in its broader aspects is therefore not limited to the specific details, representative apparatus and methods, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants' general concept.

Therefore I claim:

1. A retrofit safety lever for a firearm, the safety lever comprising:

a. a pin comprising;
  i. substantially cylindrical longitudinal end portions;
  ii. a clearance/cam portion between the substantially cylindrical end portions;
  iii. a non-cylindrical face surface on at least one longitudinal end face;
  iv. a receiving surface parallel to a longitudinal axis of the pin;

b. a first engagement lever comprising;
  i. a surface defining a clearance hole;
  ii. a mating surface operatively configured to engage the non-cylindrical face surface of the pin to facilitate rotational engagement between the first engagement lever and the pin;
  iii. a user engagement portion operatively configured to provide leverage to a user rotating the first engagement lever;
  iv. an indicator portion operatively configured to display to the user the relative rotation position of the pin;

c. a first fastener comprising:
  i. a first end with a minor diameter smaller than the clearance hole in the first engagement lever;
  ii. the first end being configured to engage the surface defining the receiving surface of the pin; and
  iii. a second end with a major diameter larger than the clearance hole in the first engagement lever.

2. The safety lever as recited in claim 1 further comprising:

a. a second engagement lever comprising;

i. a surface defining a clearance hole;

ii. a mating surface operatively configured to engage the non-cylindrical face surface of the pin opposite the first engagement lever to facilitate rotational engagement between the second engagement lever and the pin;

iii. a user engagement portion operatively configured to provide leverage to a user rotating the second engagement lever;

iv. an indicator portion operatively configured to display to the user the relative rotation position of the pin;

b. a second fastener comprising:

i. a first end with a minor diameter smaller than the clearance hole in the second engagement lever;

ii. the first end being configured to engage the receiving surface of the pin; and

iii. a second end with a major diameter larger than the clearance hole in the second engagement lever.

3. The safety lever as recited in claim 2 wherein the first engagement lever and second engagement levers are substantially identical.

4. The safety lever as recited in claim 2 further comprising:

a. a surface defining a spring receiver in each of the first and second engagement levers;

b. an indexing member operatively configured to at least partially be received in each spring receiver; and

c. a compression spring operatively configured to fit within each spring receiver and bias the indexing member toward an indexing recess of the firearm.

5. The safety lever as recited in claim 4 wherein the mating surface of the indexing member and the non-cylindrical face surface of the pin are bilaterally configured to allow connection of the indexing member to the non-cylindrical face surface of the pin in at least two unique orientations at 180° opposition.

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